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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,937	03/23/2001	James F. Brennan III	55524USA9A.002	6957

32692 7590 06/19/2003

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EXAMINER

SUCHECKI, KRYSTYNA

ART UNIT PAPER NUMBER

2882

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/816,937

Applicant(s)

BRENNAN ET AL.

Examiner

Krystyna Suchecki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Drawings

1. The corrected or substitute drawing was received on 04/04/03. The drawing correction is objected to.
2. The drawings are objected to because the following currents listed in the specification are not applied correctly to the drawing of Figure 1: a bias current (16), a current from frequency source (12) which is applied to a mirror section, and a laser gain bias. The bias current is applied directly to both the DBR to maintain the laser above threshold and to the bias tee. This is improper. The same current cannot be applied to two different portions without further explanation. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 31 is objected to because of the following informalities: The term "large" in claim 31 is a relative term which renders the claim indefinite. The term "large" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 7 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Harter (US 5,696,782).
6. Regarding Claim 1, Harter teaches a method for generating a pulse train, comprising the steps of: providing a frequency modulated signal (Column 7, lines 22-24); and impinging the signal on a dispersive element (Item 670), said dispersive element being adapted to compress the signal in time to produce said pulse train (The compression can be seen by comparing items SS and OUTPUT in figure 6, and also understood by reading the description of Figure 7, where a picosecond length pulse is compressed to a femtosecond length pulse). Also, it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.
7. Regarding Claim 2, Harter teaches a dispersive element as a fiber Bragg grating (Column 7, line 45).
8. Regarding Claim 3, Harter teaches the dispersive element as single mode fiber (Column 3, line 66 and Column 7, line 45).
9. Regarding Claim 7, Harter teaches the signal having a single longitudinal mode (Column 7, line 16).
10. Regarding Claim 29, Harter teaches a method for producing a pulse train, comprising the steps of: providing a source of a frequency modified optical signal (Column 7, lines 22-24); providing a dispersive element (Item 670); and directing the signal into the dispersive element (Figure 6); wherein the source is a frequency modified laser, and wherein the dispersive element

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is a long fiber Bragg grating (Item 670 is understood to be a long fiber Bragg grating since a second compressor, 760 appears to be the reverse of stretcher 720, which is defined as a long fiber Bragg grating).

11. Regarding Claim 30, Harter teaches a single mode signal source (Column 7, line 16).

12. Regarding Claim 31, Harter teaches a method for generating a pulse train, comprising the steps of: providing a frequency modulated signal (Column 7, lines 22-24); and impinging the frequency modulated signal on a chirped fiber optic Bragg grating (Item 670) having a large group velocity dispersion to convert said frequency modulated signal to said pulse train. By definition of group velocity dispersion, the Bragg grating of Harter has a group velocity dispersion and it is understood as being "large".

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harter in view of Eggleton (US 6,163,638).

15. Regarding Claim 6-8, Harter teaches the use of single mode fiber above, but does not teach the specific lengths of dispersive single mode fiber claimed.

16. Eggleton teaches a range of lengths of dispersive optical fiber adapted to compress a signal in time (Column 4). Eggleton also uses chirped fiber gratings (Column 4) and a frequency modulated signal (Column 5, lines 52-59) to assist with signal compression. The range of lengths

include a value of between a few kilometers to hundreds or thousands of kilometers (Column 4). The compression occurs with the dispersive fiber in order to attain high bit rate communications systems with low pulse width (Column 1, lines 40-43).

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the range of lengths, understood to include lengths of at least about 40, 60 or 80 km in the system of Harter as taught by Eggleton, since both systems use chirped grating means to assist the compression. The system of Harter would benefit from attaining a high bit rate communication system with a low pulse width (Eggleton, Column 1, lines 40-43). Also, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.

18. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harter in view of Kjebon.

19. Regarding Claim 8, Harter teaches the use of a frequency modulated laser (Column 7).

20. Harter does not explicitly teach the use of a laser equipped with a reflective element, or frequency modulation of a signal via application of a current across a reflective element.

21. Kjebon teaches a laser source with an integral dispersive element (Fig. 1). It is equipped with a reflective element and is modulated by applying a current across the reflective element (Page 488). The device of Kjebon is used for the purpose of creating a signal of 30 GHz on a laser, which according to the article by Kjebon is a record high signal with increased resonance frequency and reduced damping.

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22. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a known laser device including a reflective element and modulated by an applied current to create frequency modulated signals of high bandwidth for the laser of Harter for the benefit of using a record high bandwidth signal with increased resonance frequency and reduced damping.

Response to Arguments

23. Applicant's arguments with respect to claims 1-9 and 19-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Article to Andrekson is of interest for teaching the need in the art to compensate for signal shifting over long lengths of fibers.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

26. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

27. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

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June 11, 2003

A handwritten signature in cursive script, appearing to read "David Bruce".

DAVID V. BRUCE
PRIMARY EXAMINER